

12/08/98

3595 U.S. P.



# UTILITY PATENT APPLICATION TRANSMITTAL

*(Only for new nonprovisional applications under 37 CFR 1.53(b))*

Attorney Docket No.

36J.P170

First Named Inventor or Application Identifier

DON HIDEYASU MATSUBAYASHI

Express Mail Label No.

86/80721  
371,027,603  
U.S. PTO  
C135**APPLICATION ELEMENTS**

See MPEP chapter 600 concerning utility patent application contents.

**ADDRESS TO:**Assistant Commissioner for Patents  
Box Patent Application  
Washington, DC 202311. ☒ Fee Transmittal Form  
(Submit an original, and a duplicate for fee processing)2. ☒ Specification Total Pages **38**3. ☒ Drawings (35 USC 113) Total Sheets **12**4. ☐ Oath or Declaration Total Pages 

- a. ☐ Newly executed (original or copy)
- b. ☐ Unexecuted for information purposes
- c. ☐ Copy from a prior application (37 CFR 1.63(d))  
(for continuation/divisional with Box 17 completed)  
[Note Box 5 below]
- i. ☐ **DELETION OF INVENTOR(S)**  
Signed Statement attached deleting  
inventor(s) named in the prior application,  
see 37 CFR 1.63(d)(2) and 1.33(b).

5. ☐ Incorporation By Reference (useable if Box 4c is checked)  
The entire disclosure of the prior application, from which a  
copy of the oath or declaration is supplied under Box 4c, is  
considered as being part of the disclosure of the accompanying  
application and is hereby incorporated by reference therein.6. ☐ Microfiche Computer Program (Appendix)7. Nucleotide and/or Amino Acid Sequence Submission  
(if applicable, all necessary)

- a. ☐ Computer Readable Copy
- b. ☐ Paper Copy (identical to computer copy)
- c. ☐ Statement verifying identity of above copies

**ACCOMPANYING APPLICATION PARTS**8. ☒ Assignment Papers (cover sheet & document(s))9. ☐ 37 CFR 3.73(b) Statement (when there is an assignee) ☐ Power of Attorney10. ☐ English Translation Document (if applicable)11. ☒ Information Disclosure Statement (IDS)/PTO-1449 ☒ Copies of IDS Citations12. ☐ Preliminary Amendment13. ☒ Return Receipt Postcard (MPEP 503)  
(Should be specifically itemized)14. ☐ Small Entity Statement(s) ☐ Statement filed in prior application  
Status still proper and desired15. ☐ Certified Copy of Priority Document(s)  
(if foreign priority is claimed)16. ☐ Other: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

17. If a CONTINUING APPLICATION, check appropriate box and supply the requisite information:

☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No. \_\_\_\_/\_\_\_\_**18. CORRESPONDENCE ADDRESS**☒ Customer Number or Bar Code Label**05514**(insert Customer No. or Attach bar code label  
here)or ☐ Correspondence address below

NAME

Address

City

State

Zip Code

Country

Telephone

Fax



CLAIMS	(1) FOR	(2) NUMBER FILED	(3) NUMBER EXTRA	(4) RATE	(5) CALCULATIONS
	TOTAL CLAIMS (37 CFR 1.16(c))	24-20 =	4	X \$ 18.00 =	\$72.00
	INDEPENDENT CLAIMS (37 cfr 1.16(b))	4-3 =	1	X \$ 78.00 =	\$78.00
	MULTIPLE DEPENDENT CLAIMS (if applicable) (37 CFR 1.16(d))			\$260.00 =	\$
				BASIC FEE (37 CFR 1.16(a))	\$760.00
			Total of above Calculations =		\$910.00
	Reduction by 50% for filing by small entity (Note 37 CFR 1.9, 1.27, 1.28).				
	TOTAL =				\$910.00

19. Small entity status

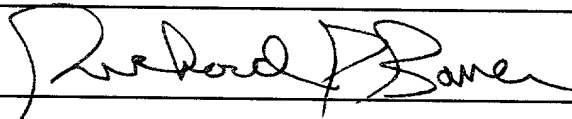
- a. ☐ A Small entity statement is enclosed
- b. ☐ A small entity statement was filed in the prior nonprovisional application and such status is still proper and desired.
- c. ☐ Is no longer claimed.

20. ☒ A check in the amount of \$910.00 to cover the filing fee is enclosed.

21. ☒ A check in the amount of \$40.00 to cover the recordal fee is enclosed.

22. The Commissioner is hereby authorized to credit overpayments or charge the following fees to Deposit Account No. 06-1205:

- a. ☒ Fees required under 37 CFR 1.16.
- b. ☒ Fees required under 37 CFR 1.17.
- c. ☐ Fees required under 37 CFR 1.18.

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED	
NAME	Richard P. Bauer, Reg. No. 31,588
SIGNATURE	
DATE	December 8, 1998

## AUTOMATED OUTPUT OF USER GUIDE

### BACKGROUND OF THE INVENTION

#### 5      Field Of The Invention

          The present invention concerns  
automatically sending data for output of an image of  
a user guide that informs a user how to configure an  
interface card that is installable in a device with  
10      image output capabilities. More particularly, the  
invention concerns an interface card that  
automatically sends such data.

#### Description Of The Related Art

15           Interface cards are often installed in  
devices with image output capabilities so as to  
interface those devices to networks or other  
devices. For example, a network interface card is  
installed in a printer so as to interface the  
20      printer to a network. Likewise, a DVD interface  
card or CD-ROM interface card is installed in a  
computer system so as to interface the computer

system to a DVD drive or a CD-ROM drive, thereby  
allowing the computer system to output images stored  
on DVD disks and CD-ROMs. As yet a further example,  
a display interface card such as a graphics  
5 accelerator card is installed in a computer so as to  
provide an improved interface to a display. Other  
examples of such interface cards exist.

When interface cards are installed by a  
manufacturer in a device, the manufacturer can  
10 easily check to see if the card is installed and  
configured properly. However, when an end user  
installs an interface card, the end user must make  
sure that the card is installed and configured  
properly. Problems are often encountered in this  
15 process, particularly by end users who are not  
familiar with the installation procedures. In  
addition, if the card does not work properly once it  
is installed, the user has little way of knowing if  
the problem is with the configuration of the card or  
20 the connection between the card and the device.

#### SUMMARY OF THE INVENTION

Accordingly, what is needed is an interface  
card that immediately provides help to a user when  
25 the card is first installed in a device and that  
informs the user if the card is properly connected  
to the device.

The invention addresses the foregoing need  
in situations where the interface card is installed  
30 in a device that has printing or other image output  
capabilities, such as a printer, copier, facsimile  
machine, display, dumb terminal, or computer that  
has one or more of these devices connected thereto.  
Examples of interface cards for such devices with  
35 image output capabilities include network interface  
cards (NICs), DVD interface cards, CD-ROM interface  
cards, display interface cards, and memory cards.

According to the invention, an interface card that is connectable to a device with image output capabilities includes a controller that sends data for output of an image of a quick-start guide to the device, with the controller sending the data once without error. After a user first installs the card in the device, the data is sent to the device. Based on the data, the device outputs an image of the quick-start guide using its image output capabilities.

By the simple fact that the image of the guide has been output, the user is assured that the interface card has been properly connected to the device. Moreover, the content of the guide itself provides immediate help to the user as to how to configure the card, as well as the answers to any other applicable help included in the guide.

Accordingly, in one aspect the invention is an interface card for a device with image output capabilities. The card includes a controller and a connector for connecting to the device. The controller sends data for output of an image of a quick-start guide from the interface card to the device through the connector. The controller sends that data once without error after the card is installed in the device. In the preferred embodiment, the data is sent in response to initial power application to the interface card, after any POST (power-on self-testing) operations are performed.

The card also preferably includes a non-volatile memory (such as EEPROM or NVRAM) that stores an indication that the data has been sent to the device without error. The controller uses this indication to determine if the data has been sent without error, thereby ensuring that the data for output of the image of the quick-start guide is not

sent again unless the interface card is reset with respect to sending the data. In the preferred embodiment, the card may be reset in this respect by resetting the indication in the non-volatile memory that the data has been sent, such as through a "flash" operation that is performed to reconfigure the firmware in the non-volatile memory.

The quick-start guide preferably provides installation and configuration instructions and information to the user. Preferably, the quick-start guide is written so as to allow a user that is not familiar with installation of interface cards to complete the installation and configuration of the card quickly.

The interface card preferably can detect information about a device to which it is attached. As a result, the card can modify the data for output of the image of the quick-start guide in accordance with the detected information. The data can be modified based on information such as a status, type, model or manufacturer of the device. For example, if the image output device is a printer, the card can detect if the printer is of a type that can output color images. If the printer can output color images, the interface card can modify the quick-start guide to include color images. On the other hand, if the printer cannot output color images, the interface card can modify the quick-start guide to include greyscale or black/white images rather than color images.

In another aspect, the invention is an interface card for a device with image output capabilities. The interface card includes a connector for connecting to the device, a memory for storing data for output of an image of a quick-start guide, and a non-volatile memory (such as EEPROM or NVRAM) for storing an indication of whether or not

the data has been sent without error to the connector. The card also includes a controller for (1) sending the data to the connector in a case that the indication stored in the non-volatile memory indicates that the data has not been sent without error, and (2) storing the indication that the data has been sent without error in a case that the data has been sent without error to the connector. In the preferred embodiment, the controller also detects if the data is sent without error.

By virtue of the foregoing arrangement, the interface card sends data for output of the image of the quick-start guide to the device once, for example when the card is first installed in the device and powered on. The image of the quick-start guide is output by the device based on this data, thereby providing immediate help to a user that is installing the card. In addition, the user is assured that the card and the device are properly connected to each other.

One example of an interface card in accordance with the invention is a network interface card (NIC) that connects a printer to a network. When the NIC is first installed in the printer and the printer is powered on, the NIC sends a print job containing data for output of an image of the quick-start guide to the printer. If the data is sent without error, the data is not sent again unless the NIC is reset with respect to whether the data has been sent.

With this arrangement, the printer outputs the image of the quick-start guide, in this case in the form of a printout. The output of the image of the quick-start guide confirms to the user that the NIC is installed properly in the printer. The actual content of the quick-start guide provides configuration help to the user.

Another example of an interface card in accordance with the invention is a DVD interface card or CD-ROM interface card that connects a computer system having a display or other image output device (i.e., image output capabilities) to a DVD drive or CD-ROM drive. When the card is installed and powered on, the controller in the card sends a signal to the computer system that ordinarily would be sent when a CD-ROM has been inserted into a CD-ROM drive connected to the CD-ROM interface card. In response, the computer system typically sends a request for a filename for an executable program stored on what appears to the computer system to be a newly-inserted CD-ROM. The controller intercepts this request and then responds by sending a filename for an executable program that resides in the CD-ROM interface card. When the computer sends a request for the executable program, the controller also intercepts this request. The controller sends the executable program from the CD-ROM interface card to the computer system in response to the intercepted request for the executable program.

When the computer system executes the executable program, the executable program causes the computer system to output an image of the quick-start guide. The image can be output either through a display or through some other image output device (e.g., a printer) that is connected to the computer. The output of the image confirms to the user that the DVD or CD-ROM interface card is properly installed and provides help to the user, for example configuration help for the card.

Yet another example of an interface card in accordance with the invention is a display interface card, such as a graphics accelerator card, that connects a computer system to a display. When the



display interface card is first installed in the computer system and the computer system is powered on, the display interface card sends data such as RGB pixel and synch information to the display for outputting an image of the quick-start guide. The output of the image confirms to the user that the display interface card is properly installed and provides help to the user, for example configuration help for the card.

This brief summary has been provided so that the nature of the invention may be understood quickly. A more complete understanding of the invention can be obtained by reference to the following detailed description of the preferred embodiments thereof in connection with the attached drawings.

#### BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a block diagram showing an interface card according to the invention.

Figure 2 is a flowchart for explaining the operation according to the invention of an interface card such as the interface card shown in Figure 1.

Figure 3 is a representational view of a printer which is interfaced to a network by a network interface card according to the invention and through which the network interface card can output an image of a quick start guide.

Figure 4 is a block diagram of the printer shown in Figure 3.

Figure 5 is a block diagram of a network interface card according to the invention that interfaces a printer to a network.

Figure 6 is a flowchart for explaining the operation according to the invention of the network interface card shown in Figure 5.

Figure 7 is a representational view of a computer system to which an interface card according to the invention can be connected.

5 Figure 8 is a block diagram of the computer system shown in Figure 7 attached to a CD-ROM drive through a CD-ROM interface card according to the invention.

Figure 9 is a block diagram of a CD-ROM interface card according to the invention.

10 Figure 10 is a flowchart for explaining the operation according to the invention of the CD-ROM interface card shown in Figure 9.

15 Figure 11 is a block diagram of the computer system shown in Figure 7 attached to a display through a display interface card (e.g., a graphics accelerator card) according to the invention.

Figure 12 is a block diagram of a display interface card according to the invention.

20 Figure 13 is a flowchart for explaining the operation according to the invention of the display interface card shown in Figure 12.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

25

[First Embodiment]

30 Figure 1 is a block diagram showing an interface card according to the invention. The interface card includes at least a connector for connecting to an image output device and a controller. The interface card preferably also includes a memory for storing data for output of an image of a quick-start guide and a non-volatile memory for storing an indication of whether or not  
35 the data has been sent without error to the connector.

Interface card 1 provides an interface between image output device 2 that is connected to connector 3 and interfaced device 4 that is connected to connector 5. Interface card 1 can be physically inserted into image output device 2 or into interfaced device 4, or interface card 1 can be part of a separate stand-alone device.

Image output device 2 is any device capable of outputting images. The images can be output as displayed images, printed images, or any other type of images. Examples of image output device 2 include, but are not limited to, printers, copiers, facsimile machines, displays, dumb terminals, or computers that have one or more of these devices connected thereto.

Controller 6 of interface card 1 is connected to connector 3 and connector 5, for example through an internal bus (not shown). Controller 6 sends data for outputting a quick-start guide to image output device 2 through connector 3, as explained in more detail below.

Controller 6 also is connected to non-volatile memory 7, memory 8 and EEPROM 9. Non-volatile memory 7 is provided for storing an indication such as flag 7a that the data for the quick-start guide has been sent. Firmware including configuration information for interface card 1 also preferably is stored in non-volatile memory 7.

The non-volatile memory preferably is an NVRAM or an EEPROM. Unless the non-volatile memory is reset, an indication stored in non-volatile memory 7 remains in the non-volatile memory even between power cycles.

In the case that non-volatile memory 7 is an NVRAM, the non-volatile memory can be reset by reloading the NVRAM so as to update the firmware stored therein. In the case that non-volatile

memory 7 is an EEPROM, the non-volatile memory can be reset through a "flash" operation which likewise is performed to update the firmware for interface card 1.

5                   Memory 8 provides memory for use by controller 6 during any operations that controller 6 must perform. EEPROM 9 stores instructions for use by controller 6 and stores data 9a for output of an image of the quick-start guide according to the invention.

10                   Interface card 1 includes other components specific to the type of interface provided by the card, for example interface controllers for controlling interfaces to image output device 2 and interfaced device 4. Examples of different types of interface cards according to the invention and their corresponding components are explained below with reference to Figures 3 through 13.

15                   Figure 2 is a flowchart for explaining the operation of interface card 1 shown in Figure 1.

20                   Briefly, the controller of the interface card sends the data for output of an image of a quick-start guide from the interface card to the device through the connector. The data is sent once without error after the card is installed in the device, unless the interface card is reset with respect to whether the data has been sent. If the interface card is reset in this respect, the data is sent again. In the preferred embodiment, the controller stores an indication in the non-volatile memory that the data has been sent without error in a case that the data has been sent without error, and the controller uses the indication to determine if the data has been sent once without error. The interface card is reset with respect to whether the data has been sent by resetting the indication.

In more detail, in step S201, the device from which the interface card receives power is powered on. The interface card can receive power from image output device 2 through connector 3, from  
5 interfaced device 4 connected to connector 5, or from some other source. Once the interface card receives power and after any power-on self-test (POST) operations, controller 6 accesses non-volatile memory 7 in step S202.

10 The controller determines in step S202 whether the non-volatile memory contains an indication that the data for output of an image of the quick-start guide has been sent from the interface card. If such an indication is present in  
15 non-volatile memory 7, then flow proceeds to steps S208 through S210 at the end of the flowchart, and interface card 1 performs its normal interface functions. If such an indication is not present, flow proceeds to step S203.

20 Controller 6 preferably detects information about image output device 2 in step S203. Based on this information, controller 6 in step S204 modifies the content of the data for the quick-start guide in EEPROM 9 and saves the modified data in memory 8.

25 The data can be modified based on information such as a status, type, model or manufacturer of the device. For example, if image output device 2 is a printer, interface card 1 can detect whether the printer is of a type that is capable of outputting  
30 color images. If the printer is capable of outputting color images, controller 6 can modify the data so that the image of the quick-start guide includes color images. Likewise, if the printer is not capable of outputting color images, controller 6  
35 can modify the data so that the image only includes greyscale or black/white images.

In step S205, the data for output of an image of the quick-start guide is read from memory 8 and sent to connector 3 by controller 6. If interface card 1 is properly connected to image output device 2, the data is received by image output device 2, and an image of the quick-start guide is generated from the data by image output device 2.

The form of the data depends on the type of image output device 2 connected to interface card 1. For example, if image output device 2 is a printer, the data preferably is in the form of a print job. If image output device 2 is a computer system with a display or printer attached thereto, the data preferably is in the form of an executable program that generates image output using the display or printer. If image output device 2 is a display, the data preferably is in the form of RGB and synch information for generating an image on the display. Each of these foregoing examples is explained in greater detail below. Other possible forms for the data exist.

The simple fact that an image of the quick-start guide is output by image output device 2 confirms to the user that interface card 1 is properly connected to image output device 2. In addition, the content of the image of the quick-start guide preferably provides installation and configuration instructions and information to the user. Preferably, the quick-start guide is written so as to allow a user that is not familiar with installation of interface cards to complete the installation and configuration of the card quickly.

After the data for output of an image of the quick-start guide is sent to connector 3, controller 6 in step S206 preferably determines if the data was sent to connector 3 without error. For

example, if connector 3 is not connected to any image output device, an error would most likely result from the attempt to send data to connector 3. If an error is detected, flow branches to steps S208 through S210, skipping step S207. As a result, the data for output of an image of the quick-start guide is sent again the next time interface card 1 is powered on.

If no error is detected, flow proceeds to step S207. In step S207, an indication that the data has been sent to connector 3 without error is stored as flag 7a in non-volatile memory 7. Flow then proceeds to steps S208 through S210.

The interface card in steps S208 through S210 performs its normal interface functions. These steps preferably occur in parallel.

In step S208, the interface card provides an interface between image output device 2 and interfaced device 4. In step S209, interface card 1 manages interfaced device 4. For example, interface card 1 might modify queues served by the device, alter the device's network name, or modify a default configuration for the device.

In step S210, interface card 1 is itself managed, such as by changing the configuration of the card or its network address. The management of interface card 1 includes changing configuration information for the interface card. The configuration information preferably is changed though flashing or reloading non-volatile memory 7. If flag 7a is reset by this flashing or reloading operation, interface card 1 is reset with respect to whether data for output of an image of a quick-start guide has been sent. As a result, the next time interface card 1 is powered on, data for output of an image of the quick-start guide is again sent to image output device 2.

In alternative embodiments, EEPROM 9 is replaced with a regular ROM, or controller 6 is hard-wired for controlling the interface card and EEPROM 9 is omitted. In other embodiments, non-volatile memory 7 and EEPROM 9 are combined into a single NVRAM or EEPROM.

[Second Embodiment]

Figure 3 is a representational view of printer 10 which is interfaced to network 11 by a network interface card according to the invention and through which the network interface card can output an image of a quick start guide. As shown in Figure 3, printer 10 includes housing 12 which provides a protective cover for printer 10. Disposed inside housing 12 is a print engine that typically includes a photosensitive drum, a laser, an image developing device, and an image transfer device. Also preferably disposed within housing 12 are printer controller 18 and network interface card 20 that is connected to printer controller 18.

In operation, a print job is received from network 11, which is preferably a local area network such as an Ethernet network, through network interface card 20. This print job is sent to printer controller 18. Under control of printer controller 18, the laser forms a latent image on the photosensitive drum based on the print job. This latent image is developed into a toner image by the developing device, and the toner image is transferred by the transfer device to a recording medium such as paper.

Although printer 10 is shown as a laser printer, any other type of printer or other device that generates printed output can utilize the network interface card according to the invention. Examples of such devices include, but are not



limited to, ink jet printers, copiers, facsimile machines, and the like.

Figure 4 is a simplified block diagram showing printer 10 connected to network 11 through network interface card 20. As shown in Figure 4, printer 10 includes print engine 14 for outputting images onto a recording medium. Print engine 14 is controlled by printer controller 18, and printer controller 18 is functionally connected to connector 21 such as by a bus. Network interface card 20 according to the invention is connected to printer 10 through connector 21.

Network interface card 20 preferably is installed in printer 10 and connects printer 10 to network 11. In the preferred embodiment, network interface card 20 provides device-specific services, such as job buffering and spooling, as well as management services to printer 10. In addition, network interface card 20 automatically sends data for output of a quick-start guide to printer 10 once without error, as discussed below.

Figure 5 is a block diagram of network interface card 20 according to the invention for interfacing printer 10 to network 11. As shown in Figure 5, network interface card 20 includes processor 31 such as an Intel 80188 8-bit programmable microprocessor which is interfaced to bus 32. This processor serves to provide the functionality needed to interface printer 10 to network 11. For example, processor 31 controls print buffering and spooling. In addition, processor 31 serves as the controller for controlling output of data for an image of a quick-start guide according to the invention.

Also interfacing with bus 32 are non-volatile memory 34, memory 35, and EEPROM 36. Configuration parameters are stored in non-volatile

memory 34, as well as an indication of whether data for output of an image of a quick-start guide has been sent from the network interface card. This indication preferably is stored as flag 34a in non-volatile memory 34. Other information that must be preserved when the card is powered off also is stored in non-volatile memory 34.

Process steps for execution by processor 31 are stored in EEPROM 36, but in general, those process steps are loaded into and executed out of memory 35. In addition, data 36a for output of the image of the quick-start guide also preferably is stored in EEPROM 36, and data 36a is loaded into memory 35 before being sent to connector 41 by processor 31.

Connector 41 provides a connection to printer 10. The interface between network interface card 20 and printer 10 is controlled by printer interface controller 42. This controller may be of any of a variety of different controllers and can be bi-directional (e.g., an IEEE 1284 interface, a dual port RAM interface, and the like) or uni-directional (e.g., a Centronix RS-232 interface). Static random access memory (SRAM) 43 provides temporary storage for buffering messages sent to and from printer 10.

Connector 46 provides a connection to network 11. This connection is controlled by network connection controller 47, which handles encoding and decoding network traffic for network interface card 20. SRAM 48 provides temporary storage of network data (e.g., network packets) sent to and from network interface card 20.

LED indicators 49 also are interfaced to bus 32 and are used to provide some feedback information to a user about the status of network interface card 20.

Figure 6 is a flowchart for explaining the operation of network interface card 20 when sending data for output of an image of a quick-start guide by printer 10. In step S601, printer 10 is powered on, thereby providing power to network interface card 20. In step S602, after any POST operations, processor 31 accesses non-volatile memory 34 so as to determine if data for output of an image of a quick-start guide has been sent to connector 41, and thus to printer 10. Processor 31 determines if the data has been sent by checking for an indication such as flag 34a in non-volatile memory 34. If such an indication exists, flow proceeds to the interface operations at the end of the flowchart, namely steps S609 through S611. If such an indication does not exist, flow proceeds to step S603.

In step S603, processor 31 preferably detects information about printer 10 through connector 41. This information can include the status, type, model and/or manufacturer of printer 10. In step S604, processor 31 modifies data 36a based on the detected information.

For example, if processor 31 detects that printer 10 is a color printer, processor 31 can modify data 36a to include data for outputting color images. On the other hand, if processor 31 detects that printer 10 is not a color printer, processor 31 can modify data 36a to include data for outputting greyscale or black/white images instead of color images.

In steps S605 and S606, processor 31 sends data 36a for output of an image of a quick-start guide to connector 41 through printer interface controller 42. In order to send the data, in step S605 processor 31 preferably builds a print job in memory 35 from data 36a for the quick-start guide stored in EEPROM 36. Then, in step S606, processor

31 send the print job to printer interface controller 42, which in turn sends the print job through connector 41 to printer 10.

5       The print job can include any number of printed pages, possibly modified as discussed above based on the status, type, model, and manufacturer of printer 10. However, as the image is of a quick-start guide, the print job should be relatively short. In the preferred embodiment, the  
10       quick-start guide includes networking information for connecting printer 10 to network 11 through network interface card 20.

      Next, processor 31 in step S607 determines if the print job was sent to printer 10 without  
15       error. In the preferred embodiment, printer interface controller 42 handles any error conditions that occur when sending the print job and reports to processor 31 whether the print job was sent without error. If the print job was sent without error,  
20       flow proceeds to step S608. Otherwise, if an error occurred, flow branches to steps S609 through S611, skipping step S608. As a result, the data for output of an image of the quick-start guide is sent again the next time network interface card 20 is  
25       powered on.

      In step S608, processor 31 stores an indication such as flag 34a that the print job was sent without error. This indication is stored in non-volatile memory 34. As a result, the next time  
30       network interface card 20 is powered on, flow proceeds from step S602 to steps S609 through S611, unless the indication is reset in step S611 discussed below.

      After step S608, flow proceeds to steps  
35       S609 through S611, which preferably occur in parallel. In steps S609 through S611, network

interface card 20 performs normal interface operations.

5 In more detail, in step S609, network interface card 20 provides printer 10 with an interface to network 21. This interface allows printer 10 to communicate with network 21, for example for receiving print jobs and for reporting printer status.

10 In step S610, network interface card 20 manages printer 10. For example, network interface card 20 might modify queues served by the printer, alter the printer's network name, or modify a default configuration for the printer. In step S611, network interface card 20 is itself managed, 15 such as by changing the configuration of the network interface card or its network address.

20 The management of network interface card 20 in step S611 includes changing configuration information for the network interface card. The configuration information preferably is changed though flashing or reloading non-volatile memory 34. If flag 34a is reset by this flashing or reloading operation, network interface card 20 is reset with respect to whether data for output of an image of a 25 quick-start guide has been sent. As a result, the next time network interface card 20 is powered on, data for output of an image of the quick-start guide is again sent to printer 10.

30 [Third Embodiment]

Figure 7 is a representational view of another embodiment of the invention, showing an image output device that can be used with an interface card according to the invention. Shown in 35 Figure 7 is a computer system which can output images either through a display or a printer, and in which an interface card provides an interface

between a CD-ROM drive and the computer system. It should be noted that while the following discussion describes the third embodiment with respect to a CD-ROM drive, the same discussion is equally applicable to other types of storage devices such as fixed disks, DVD drives, tape drives and the like.

Computer system 50 shown in Figure 7 may be a Macintosh, PC-compatible, or other type of system having an operating system which preferably is a windowing operating system, such as Microsoft® Windows, but which may also be a non-windowing system such as DOS or UNIX. In the preferred embodiment, computer system 50 is a Pentium®-based computer system. It should be understood that, although a programmable general purpose computer system is shown in Figure 7, a dedicated computer terminal or other type of data processing equipment can utilize the present invention.

Provided with computer system 50 are display 52 (which may be a color monitor) for displaying images, keyboard 54 for entering user commands, and pointing device 55 such as a mouse for pointing to and for manipulating graphical user interfaces and other objects displayed on display 52. Computer system 50 also includes a mass storage device such as fixed disk 56 for storing computer executable process steps for an operating system, device drivers, application programs, data and the like. Such storage may also be provided by CD-ROM drive 58. Floppy disk interface 59 provides an interface to floppy disks for removable storage.

Printer 60 is provided for outputting images for computer system 50. As mentioned above, images also can be output (i.e., displayed) by display 52.

Figure 8 is a block diagram of computer system 50 shown in Figure 7 attached to a CD-ROM

drive through a CD-ROM interface card according to the invention. As shown in Figure 8, computer system 50 includes central processing unit (CPU) 63 which interfaces with computer bus 64. Also  
5 interfacing with computer bus 64 are fixed disk 56, main memory (RAM) 66, read only memory (ROM) 67, floppy disk interface 69, display interface 70 to display 52, printer interface 71 to printer 60, keyboard interface 72 to keyboard 54, mouse  
10 interface 73 to pointing device 55, and interface card connector 75 such as an EIDE or SCSI connector.

Main memory 66 interfaces with computer bus 64 so as to provide RAM storage to CPU 63 during execution of application programs. More  
15 specifically, CPU 63 loads process steps from fixed disk 56, another storage device such as CD-ROM drive 58, or some other source into main memory 66. CPU 63 then executes the stored process steps from main memory 66 in order to execute application programs.

As also shown in Figure 8, fixed disk 56 typically contains an operating system, device drivers such as a display driver and a printer driver, and other files including application programs and data.

Interface card connector 75 provides a connection to devices connected to computer system 50. In Figure 8, CD-ROM interface card 78 is connected to interface card connector 75 so as to provide an interface to CD-ROM drive 58. In the  
25 preferred embodiment, CD-ROM interface card 78 is installed inside computer system 50, although the CD-ROM interface card can be installed in a stand-alone CD-ROM drive device. According to the invention, CD-ROM interface card 78 sends data for  
30 output of an image of a quick-start guide to computer system 50 through interface card connector  
35

75 once (unless reset with respect to sending the data) without error.

Figure 9 is a block diagram of CD-ROM interface card 78 according to the invention for interfacing computer system 50 to CD-ROM drive 58. As shown in Figure 9, CD-ROM interface card 78 includes processor 81 such as an Intel 80188 8-bit programmable microprocessor which is interfaced to bus 82. This processor serves to provide the functionality needed to interface CD-ROM drive 58 to computer system 50. For example, processor 81 controls access to files and data stored on a CD-ROM inserted into CD-ROM drive 58. In addition, processor 81 serves as the controller for controlling output of data for an image of a quick-start guide according to the invention.

Also interfacing with bus 82 are non-volatile memory 83, memory 84, and EEPROM 85. Configuration parameters are stored in non-volatile memory 83, as well as an indication of whether data for output of an image of a quick-start guide has been sent from the CD-ROM interface card. This indication preferably is stored as flag 83a in non-volatile memory 83. Other information that must be preserved when the card is powered off is stored in non-volatile memory 83.

Process steps for execution by processor 81 are stored in EEPROM 85, but in general, those process steps are loaded into and executed out of memory 84. In addition, data 85a for output of the image of the quick-start guide also preferably is stored in EEPROM 85, and data 85a is loaded into memory 84 before being sent to connector 86 by processor 81. Data 85a preferably is an executable program which when executed by computer system 50 causes computer system 50 to output an image of the quick-start guide.



Connector 86 provides a connection to interface card connector 75 of computer 50. Likewise, connector 87 provides a connection to CD-ROM drive 58. In order to provide a user with information when CD-ROM interface card 78 is first installed, processor 81 sends data for output of an image of a quick-start guide to connector 86 when the CD-ROM interface card is first installed and powered on. The mechanism for sending this data is explained below with reference to Figure 10.

Figure 10 is a flowchart for explaining the operation of CD-ROM interface card 78 when sending data for output of an image of a quick-start guide by computer system 50. In step S1001, computer 50 is powered on, thereby providing power to CD-ROM interface card 78. In step S1002, after any POST operations, processor 81 accesses non-volatile memory 83 so as to determine if data for output of an image of a quick-start guide has been sent to connector 86, and thus to computer system 50. Processor 81 determines if the data has been sent by checking for an indication such as flag 83a in non-volatile memory 83. If such an indication exists, flow proceeds to the interface operations at the end of the flowchart, namely steps S1012 to S1014. If such an indication does not exist, flow proceeds to step S1003.

In step S1003, processor 81 preferably detects information about computer system 50 through connector 86. This information can include the status, type, model and/or manufacturer of computer system 50. In step S1004, processor 81 modifies data 85a based on the detected information. For example, if processor 81 detects that computer system 50 cannot output images through a printer, processor 81 can modify data 85a for output through a display.

In steps S1005 to S1009, processor 81 sends data for output of an image of a quick-start guide to connector 86. In more detail, in step S1005, processor 81 sends a signal to computer system 50 that ordinarily would be sent when a CD-ROM has been inserted into a CD-ROM drive connected to the CD-ROM interface card. This signal preferably is sent even if a CD-ROM drive is not connected to CD-ROM interface card 78. Computer system 50 interprets this signal to mean that a CD-ROM has newly been inserted into a CD-ROM drive, and computer system 50 responds accordingly.

Specifically, in response to such a signal, computer system 50 typically attempts to access what appears to the computer system to be a newly-inserted CD-ROM. Computer system 50 attempts to access the CD-ROM through CD-ROM interface card 78 so as to locate a filename for an executable program the should be run automatically. For example, if computer system 50 is running Windows® 95, computer system 50 attempts to access a file entitled "autorun.inf" on a newly-inserted CD-ROM. In Windows® 95, this "autorun.inf" file contains a filename for an executable program stored on the CD-ROM that should be run automatically. The filename for this executable program is often "autorun.exe".

In step S1006, processor 81 intercepts the request from computer system 50 for the filename. Then, in step S1007, processor 81 responds to this request by sending a filename for an executable program that resides in the CD-ROM interface card. When computer system 50 sends a request for the executable program with that filename, processor 81 intercepts that request in step S1008. In step S1009, processor 81 sends the executable program stored in data 85a to computer system 50 through

connector 86. When computer system 50 receives the executable program from connector 86 and runs the program, computer system 50 outputs an image of the quick-start guide, either through display 52 or through printer 60, using the display or print drivers on disk 56.

In the preferred embodiment, the application program contains the data for the image. Alternatively, the executable program can request the data from CD-ROM interface card 78. In any case, once the executable program is sent to connector 86 without error, flow proceeds to step S1010.

Processor 81 in step S1010 determines if the data was sent to computer system 50 without error. If the data was sent without error, flow proceeds to step S1011. Otherwise, if an error occurred, flow branches to steps S1012 through S1014, skipping step S1011. As a result, the data for output of an image of the quick-start guide is sent again the next time CD-ROM interface card 78 is powered on.

In step S1011, processor 81 stores an indication such as flag 83a that the print job was sent without error. This indication is stored in non-volatile memory 83. As a result, the next time CD-ROM interface card 78 is powered on, flow proceeds from step S1002 to steps S1012 through S1014, unless the indication is reset in step S1014 discussed below.

After step S1011, flow proceeds to steps S1012 through S1014, which preferably occur in parallel. In steps S1012 through S1014, CD-ROM interface card 78 performs normal interface operations.

In more detail, in step S1012, CD-ROM interface card 78 provides computer system 50 with

an interface to CD-ROM drive 58. This interface allows computer system 50 to access CD-ROMs inserted into CD-ROM drive 58, for example to load programs and data from a CD-ROM.

5           In step S1013, CD-ROM interface card 78 manages CD-ROM drive 58. For example, CD-ROM interface card 78 changes the access speed of the CD-ROM drive and controls access timing for accessing information on CD-ROMs.

10           In step S1014, CD-ROM interface card 78 is itself managed. The management of CD-ROM interface card 78 in step S1014 includes changing configuration information for the CD-ROM interface card. The configuration information preferably is  
15           changed though flashing or reloading non-volatile memory 83. If flag 83a is reset by this flashing or reloading operation, CD-ROM interface card 78 is reset with respect to whether data for outputting an image of a quick-start guide has been sent. As a  
20           result, the next time CD-ROM interface card 78 is powered on, data for output of an image of the quick-start guide is again sent to computer system 50.

25           In an alternative embodiment, CD-ROM interface card 78 and CD-ROM drive 58 are replaced with a DVD interface card and a DVD drive. In that case, operation proceeds substantially the same as described above with respect to the CD-ROM example.

30           [Fourth Embodiment]

35           Figure 11 is a block diagram of yet another embodiment of the invention, in this case a computer system attached to a display through a display interface card according to the invention. The structure of computer system 50 in Figure 11 is substantially identical to the structure shown in Figure 8, except that display 52 is interfaced to

computer system 50 through display interface card 90. An example of such a display interface card is a graphics accelerator card.

5 Accordingly, computer system 50 shown in Figure 11 includes CPU 63, fixed disk 56, and main memory 66, all interfaced to computer bus 64. As explained above, CPU 63 loads process steps from fixed disk 56, another storage device, or some other source into main memory 66, and then executes the  
10 stored process steps from main memory 66 in order to execute application programs.

Also interfaced to computer bus 64 are floppy disk interface 59, ROM 67, display interface 70, printer interface 71, keyboard interface 72,  
15 mouse interface 73 and interface card connector 76. Interface card connector 76 preferably is an expansion slot such as a PCI or an ISA slot.

Display 52 is connected to computer system 50 through display interface card 90, which in turn  
20 is connected to interface card connector 76. Because display 52 is connected through display interface card 90, display interface 70 is unused.

Figure 12 is a block diagram of display interface card 90 according to the invention for  
25 interfacing display 52 to computer system 50. An example of such a display interface card is a graphics accelerator card.

As shown in Figure 12, display interface card 90 includes processor 91 such as an Intel 80188  
30 8-bit programmable microprocessor which is interfaced to bus 92. Also interfaced to bus 92 are graphics engine 93, video memory 94, and digital to analog converter (DAC) 95.

Processor 91 and graphics engine 93 operate  
35 to store video data in video memory 94 in response to graphics commands received from computer system 50 through connector 96. In addition, processor 91

2025 RELEASE UNDER E.O. 14176

serves as the controller for controlling output of data for an image of a quick-start guide according to the invention.

5 DAC 95 operates under the control of processor 91 to convert digital data in video memory 94 into analog red, green and blue (RGB) color pixel information for display by display 52. This RGB pixel information is sent to display 52 through connector 97, along with synch information generated  
10 by graphics engine 93.

Also interfacing with bus 92 are non-volatile memory 100, memory 101, and EEPROM 102. Configuration parameters are stored in non-volatile memory 100, as well as an indication of whether data  
15 for output of an image of a quick-start guide has been sent from the display interface card. This indication is preferably stored as flag 100a in non-volatile memory 100. Other information that must be preserved when the card is powered off is  
20 stored in non-volatile memory 100.

Process steps for execution by processor 91 are stored in EEPROM 102, but in general, those process steps are loaded into and executed out of memory 101. In addition, data 102a for output of  
25 the image of the quick-start guide also preferably is stored in EEPROM 102. Data 102a is loaded into video memory 94, where it is output by DAC 95 through connector 97 to display 52 in the form of RGB and synch information.

30 Figure 13 is a flowchart for explaining the operation of display interface card 90 when sending data for output of an image of a quick-start guide by display 52. In step S1301, computer system 50 is powered on, thereby providing power to display  
35 interface card 90. In step S1302, after any POST operations, processor 91 accesses non-volatile memory 100 so as to determine if data for output of

an image of a quick-start guide has been sent to connector 97, and thus to display 52. Processor 91 determines if the data has been sent by checking for an indication such as flag 100a in non-volatile memory 100. If such an indication exists, flow proceeds to the interface operations at the end of the flowchart, namely steps S1310 through S1312. If such an indication does not exist, flow proceeds to step S1303.

10               In steps S1303, processor 91 preferably detects information about display 52 through connector 97. This information can include the status, type, model and/or manufacturer of display 52. In step S1304, processor 91 modifies data 102a based on the detected information.

15               For example, if processor 91 detects that display 52 has a maximum screen size of 800 pixels by 600 pixels, processor 91 modifies data 102a so as to ensure that an image of the quick-start guide fits within that screen size.

20               In steps S1305 to S1307, processor 91 sends data in the form of RGB and synch information for output of an image of a quick-start guide to connector 97. This information causes display 52 to output an image of the quick-start guide.

25               In more detail, in step S1305, processor 91 stores data 102a from EEPROM 102 into video memory 94. In step S1306, DAC 95 converts the data in video memory 94 into RGB pixel information. At the same time, CPU 91 controls graphics engine 93 so as to generate synch information for outputting the image of the quick-start guide. The RGB and synch information is sent to connector 97 in step S1307, causing the image of the quick-start guide to be output by display 52.

35               Processor 91 in step S1308 determines if the RGB and synch information was sent to display 52

without error. If the information was sent without error, flow proceeds to step S1309. Otherwise, if an error occurred, flow branches to steps S1310 through S1312, skipping step S1309. As a result,  
5 the data for output of an image of the quick-start guide is sent again the next time display interface card 90 is powered on.

In step S1309, processor 91 stores an indication such as flag 100a that the RGB and synch  
10 information was sent without error. This indication is stored in non-volatile memory 100. As a result, the next time display interface card 90 is powered on, flow proceeds from step S1302 to steps S1310 through S1312, unless the indication is reset in  
15 step S1312 discussed below.

After step S1309, flow proceeds to steps S1310 through S1312, which preferably occur in parallel. In steps S1310 through S1312, display interface card 90 performs normal interface  
20 operations.

In more detail, in step S1310, display interface card 90 provides computer system 50 with an interface to display 52. This interface allows computer system 50 to output images using display  
25 52, preferably in a manner that is in some fashion superior to the manner possible using display interface 70.

In step S1311, display interface card 90 manages display 52. For example, display interface  
30 card 90 changes the displayable screen size (in pixels), the refresh rate, and the mode of the display.

In step S1312, display interface card 90 is itself managed. The management of display interface  
35 card 90 in step S1312 includes changing configuration information for the display interface card. The configuration information preferably is



changed though flashing or reloading non-volatile  
memory 100. If flag 100a is reset by this flashing  
or reloading operation, display interface card 90 is  
reset with respect to whether data for outputting an  
5 image of a quick-start guide has been sent. As a  
result, the next time display interface card 90 is  
powered on, data for output of an image of the  
quick-start guide is again sent to display 52.

While the invention is described above with  
10 respect to what is currently considered its  
preferred embodiments, it is to be understood that  
the invention is not limited to that described  
above. To the contrary, the invention is intended  
to cover various modifications and equivalent  
15 arrangements included within the spirit and scope of  
the appended claims.

32344 4 44 000

WHAT IS CLAIMED IS:

1. An interface card for a device with  
image output capabilities, comprising:  
5 a connector for connecting to the device;  
a controller for sending data for output of  
an image of a quick-start guide from the interface  
card to the device through the connector, wherein  
the data is sent once without error after the card  
10 is installed in the device.

2. The interface card according to  
Claim 1, further including a non-volatile memory,  
wherein the controller stores an indication  
15 in the non-volatile memory that the data has been  
sent without error in a case that the data has been  
sent without error,  
wherein the interface card uses the  
indication to determine if the data has been sent  
20 once without error, and  
wherein the interface card is reset with  
respect to whether the data has been sent by  
resetting the indication.

3. An interface card for a device with  
image output capabilities, comprising:  
a connector for connecting to the device;  
a controller for sending data for output of  
an image of a quick-start guide from the interface  
30 card to the device through the connector, wherein  
the data is sent once without error, and once  
without error following each reset of the interface  
card with respect to whether the data has been sent.

4. The interface card according to  
Claim 3, further including a non-volatile memory,

5           wherein the interface card uses the  
indication to determine if the quick-start guide has  
been sent once without error, and  
            wherein the interface card is reset with  
respect to whether the data has been sent by  
10       resetting the indication.

15

20

25

30

35

10. An interface card according to Claim 8, wherein the computer system has a printer

connected thereto, and wherein the image of the quick-start guide is output through the printer onto a recording medium.

5                   11. An interface card according to  
Claim 8, wherein the controller sends the data from  
the CD-ROM interface card to the computer system by  
performing the following steps of:  
                  sending a signal to the computer system  
10   that ordinarily would be sent when a CD-ROM has been  
inserted into a CD-ROM drive connected to the CD-ROM  
interface card;  
                  intercepting a request from the computer  
system for a filename for an executable program;  
15                sending the filename for the executable  
program to the computer system in response to the  
request for the filename, the executable program  
residing in the CD-ROM interface card;  
                  intercepting a request from the computer  
20   system for the executable program; and  
                  sending the executable program to the  
computer system in response to the request for the  
executable program,  
                  wherein when the computer system executes  
25   the executable program, the executable program  
causes the computer system to output an image of the  
quick-start guide.

30                   12. An interface card according to  
Claim 4, wherein the interface card comprises a DVD  
interface card, and the device comprises a computer  
system.

35                   13. An interface card according to  
Claim 4, wherein the interface card comprises a  
display interface card, and the device comprises a

display that is connectable to a computer system through the display interface card.

5           14. An interface card according to Claim 13, wherein the data comprises RGB pixel information and synch information.

10           15. An interface card according to Claim 4, wherein the controller also detects if the data is sent without error.

15           16. An interface card according to Claim 4, wherein the controller detects information about the device and modifies the data in accordance with the detected information.

20           17. An interface card according to Claim 4, wherein the non-volatile memory comprises a NVRAM.

25           18. An interface card according to Claim 17, wherein the NVRAM stores firmware for the interface card, and wherein in a case the firmware is updated by reloading the NVRAM, the indication that the data has been sent without error is reset.

30           19. An interface card according to Claim 4, wherein the non-volatile memory comprises an EEPROM.

35           20. An interface card according to Claim 19, wherein the EEPROM stores firmware for the interface card, and wherein in a case the firmware is updated by flashing the EEPROM, the indication that the data has been sent without error is reset.

21. An interface card according to Claim 4, wherein the device has a housing and wherein the interface card is disposed within the housing.

5

22. An interface card according to Claim 4, wherein the device has a housing and where the interface card has a housing different than the housing for the device.

10

23. An interface card for a device with image output capabilities, comprising:  
a connector for connecting to the device;  
a memory for storing data for output of an  
15 image of a quick-start guide;  
a non-volatile memory for storing an indication of whether or not the data has been sent without error to the connector;  
a controller responsive to application of  
20 power for (1) sending the data to the connector in a case that the indication stored in the non-volatile memory indicates that the data has not been sent without error; and (2) storing the indication that the data has been sent without error in a case that  
25 the data has been sent without error to the connector.

24. A network interface card for connecting an image output device to a network, comprising:

30 a connector for connecting to an image output device;  
a memory for storing data for output of an image of a quick-start guide;  
35 a non-volatile memory for storing an indication of whether or not the data has been sent without error to the connector;

5 a controller responsive to application of power for (1) sending the data to the connector in a case that the indication stored in the non-volatile memory indicates that the data has not been sent without error; and (2) storing the indication that the data has been sent without error in a case that the data has been sent without error to the connector.

5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60  
61  
62  
63  
64  
65  
66  
67  
68  
69  
70  
71  
72  
73  
74  
75  
76  
77  
78  
79  
80  
81  
82  
83  
84  
85  
86  
87  
88  
89  
90  
91  
92  
93  
94  
95  
96  
97  
98  
99  
100  
101  
102  
103  
104  
105  
106  
107  
108  
109  
110  
111  
112  
113  
114  
115  
116  
117  
118  
119  
120  
121  
122  
123  
124  
125  
126  
127  
128  
129  
130  
131  
132  
133  
134  
135  
136  
137  
138  
139  
140  
141  
142  
143  
144  
145  
146  
147  
148  
149  
150  
151  
152  
153  
154  
155  
156  
157  
158  
159  
160  
161  
162  
163  
164  
165  
166  
167  
168  
169  
170  
171  
172  
173  
174  
175  
176  
177  
178  
179  
180  
181  
182  
183  
184  
185  
186  
187  
188  
189  
190  
191  
192  
193  
194  
195  
196  
197  
198  
199  
200  
201  
202  
203  
204  
205  
206  
207  
208  
209  
210  
211  
212  
213  
214  
215  
216  
217  
218  
219  
220  
221  
222  
223  
224  
225  
226  
227  
228  
229  
230  
231  
232  
233  
234  
235  
236  
237  
238  
239  
240  
241  
242  
243  
244  
245  
246  
247  
248  
249  
250  
251  
252  
253  
254  
255  
256  
257  
258  
259  
260  
261  
262  
263  
264  
265  
266  
267  
268  
269  
270  
271  
272  
273  
274  
275  
276  
277  
278  
279  
280  
281  
282  
283  
284  
285  
286  
287  
288  
289  
290  
291  
292  
293  
294  
295  
296  
297  
298  
299  
300  
301  
302  
303  
304  
305  
306  
307  
308  
309  
310  
311  
312  
313  
314  
315  
316  
317  
318  
319  
320  
321  
322  
323  
324  
325  
326  
327  
328  
329  
330  
331  
332  
333  
334  
335  
336  
337  
338  
339  
340  
341  
342  
343  
344  
345  
346  
347  
348  
349  
350  
351  
352  
353  
354  
355  
356  
357  
358  
359  
360  
361  
362  
363  
364  
365  
366  
367  
368  
369  
370  
371  
372  
373  
374  
375  
376  
377  
378  
379  
380  
381  
382  
383  
384  
385  
386  
387  
388  
389  
390  
391  
392  
393  
394  
395  
396  
397  
398  
399  
400  
401  
402  
403  
404  
405  
406  
407  
408  
409  
410  
411  
412  
413  
414  
415  
416  
417  
418  
419  
420  
421  
422  
423  
424  
425  
426  
427  
428  
429  
430  
431  
432  
433  
434  
435  
436  
437  
438  
439  
440  
441  
442  
443  
444  
445  
446  
447  
448  
449  
450  
451  
452  
453  
454  
455  
456  
457  
458  
459  
460  
461  
462  
463  
464  
465  
466  
467  
468  
469  
470  
471  
472  
473  
474  
475  
476  
477  
478  
479  
480  
481  
482  
483  
484  
485  
486  
487  
488  
489  
490  
491  
492  
493  
494  
495  
496  
497  
498  
499  
500  
501  
502  
503  
504  
505  
506  
507  
508  
509  
510  
511  
512  
513  
514  
515  
516  
517  
518  
519  
520  
521  
522  
523  
524  
525  
526  
527  
528  
529  
530  
531  
532  
533  
534  
535  
536  
537  
538  
539  
540  
541  
542  
543  
544  
545  
546  
547  
548  
549  
550  
551  
552  
553  
554  
555  
556  
557  
558  
559  
560  
561  
562  
563  
564  
565  
566  
567  
568  
569  
570  
571  
572  
573  
574  
575  
576  
577  
578  
579  
580  
581  
582  
583  
584  
585  
586  
587  
588  
589  
590  
591  
592  
593  
594  
595  
596  
597  
598  
599  
600  
601  
602  
603  
604  
605  
606  
607  
608  
609  
610  
611  
612  
613  
614  
615  
616  
617  
618  
619  
620  
621  
622  
623  
624  
625  
626  
627  
628  
629  
630  
631  
632  
633  
634  
635  
636  
637  
638  
639  
640  
641  
642  
643  
644  
645  
646  
647  
648  
649  
650  
651  
652  
653  
654  
655  
656  
657  
658  
659  
660  
661  
662  
663  
664  
665  
666  
667  
668  
669  
670  
671  
672  
673  
674  
675  
676  
677  
678  
679  
680  
681  
682  
683  
684  
685  
686  
687  
688  
689  
690  
691  
692  
693  
694  
695  
696  
697  
698  
699  
700  
701  
702  
703  
704  
705  
706  
707  
708  
709  
710  
711  
712  
713  
714  
715  
716  
717  
718  
719  
720  
721  
722  
723  
724  
725  
726  
727  
728  
729  
730  
731  
732  
733  
734  
735  
736  
737  
738  
739  
740  
741  
742  
743  
744  
745  
746  
747  
748  
749  
750  
751  
752  
753  
754  
755  
756  
757  
758  
759  
760  
761  
762  
763  
764  
765  
766  
767  
768  
769  
770  
771  
772  
773  
774  
775  
776  
777  
778  
779  
780  
781  
782  
783  
784  
785  
786  
787  
788  
789  
790  
791  
792  
793  
794  
795  
796  
797  
798  
799  
800  
801  
802  
803  
804  
805  
806  
807  
808  
809  
810  
811  
812  
813  
814  
815  
816  
817  
818  
819  
820  
821  
822  
823  
824  
825  
826  
827  
828  
829  
830  
831  
832  
833  
834  
835  
836  
837  
838  
839  
840  
841  
842  
843  
844  
845  
846  
847  
848  
849  
850  
851  
852  
853  
854  
855  
856  
857  
858  
859  
860  
861  
862  
863  
864  
865  
866  
867  
868  
869  
870  
871  
872  
873  
874  
875  
876  
877  
878  
879  
880  
881  
882  
883  
884  
885  
886  
887  
888  
889  
890  
891  
892  
893  
894  
895  
896  
897  
898  
899  
900  
901  
902  
903  
904  
905  
906  
907  
908  
909  
910  
911  
912  
913  
914  
915  
916  
917  
918  
919  
920  
921  
922  
923  
924  
925  
926  
927  
928  
929  
930  
931  
932  
933  
934  
935  
936  
937  
938  
939  
940  
941  
942  
943  
944  
945  
946  
947  
948  
949  
950  
951  
952  
953  
954  
955  
956  
957  
958  
959  
960  
961  
962  
963  
964  
965  
966  
967  
968  
969  
970  
971  
972  
973  
974  
975  
976  
977  
978  
979  
980  
981  
982  
983  
984  
985  
986  
987  
988  
989  
990  
991  
992  
993  
994  
995  
996  
997  
998  
999  
1000  
1001  
1002  
1003  
1004  
1005  
1006  
1007  
1008  
1009  
1010  
1011  
1012  
1013  
1014  
1015  
1016  
1017  
1018  
1019  
1020  
1021  
1022  
1023  
1024  
1025  
1026  
1027  
1028  
1029  
1030  
1031  
1032  
1033  
1034  
1035  
1036  
1037  
1038  
1039  
1040  
1041  
1042  
1043  
1044  
1045  
1046  
1047  
1048  
1049  
1050  
1051  
1052  
1053  
1054  
1055  
1056  
1057  
1058  
1059  
1060  
1061  
1062  
1063  
1064  
1065  
1066  
1067  
1068  
1069  
1070  
1071  
1072  
1073  
1074  
1075  
1076  
1077  
1078  
1079  
1080  
1081  
1082  
1083  
1084  
1085  
1086  
1087  
1088  
1089  
1090  
1091  
1092  
1093  
1094  
1095  
1096  
1097  
1098  
1099  
1100  
1101  
1102  
1103  
1104  
1105  
1106  
1107  
1108  
1109  
1110  
1111  
1112  
1113  
1114  
1115  
1116  
1117  
1118  
1119  
1120  
1121  
1122  
1123  
1124  
1125  
1126  
1127  
1128  
1129  
1130  
1131  
1132  
1133  
1134  
1135  
1136  
1137  
1138  
1139  
1140  
1141  
1142  
1143  
1144  
1145  
1146  
1147  
1148  
1149  
1150  
1151  
1152  
1153  
1154  
1155  
1156  
1157  
1158  
1159  
1160  
1161  
1162  
1163  
1164  
1165  
1166  
1167  
1168  
1169  
1170  
1171  
1172  
1173  
1174  
1175  
1176  
1177  
1178  
1179  
1180  
1181  
1182  
1183  
1184  
1185  
1186  
1187  
1188  
1189  
1190  
1191  
1192  
1193  
1194  
1195  
1196  
1197  
1198  
1199  
1200  
1201  
1202  
1203  
1204  
1205  
1206  
1207  
1208  
1209  
1210  
1211  
1212  
1213  
1214  
1215  
1216  
1217  
1218  
1219  
1220  
1221  
1222  
1223  
1224  
1225  
1226  
1227  
1228  
1229  
1230  
1231  
1232  
1233  
1234  
1235  
1236  
1237  
1238  
1239  
1240  
1241  
1242  
1243  
1244  
1245  
1246  
1247  
1248  
1249  
1250  
1251  
1252  
1253  
1254  
1255  
1256  
1257  
1258  
1259  
1260  
1261  
1262  
1263  
1264  
1265  
1266  
1267  
1268  
1269  
1270  
1271  
1272  
1273  
1274  
1275  
1276  
1277  
1278  
1279  
1280  
1281  
1282  
1283  
1284  
1285  
1286  
1287  
1288  
1289  
1290  
1291  
1292  
1293  
1294  
1295  
1296  
1297  
1298  
1299  
1300  
1301  
1302  
1303  
1304  
1305  
1306  
1307  
1308  
1309  
1310  
1311  
1312  
1313  
1314  
1315  
1316  
1317  
1318  
1319  
1320  
1321  
1322  
1323  
1324  
1325  
1326  
1327  
1328  
1329  
1330  
1331  
1332  
1333  
1334  
1335  
1336  
1337  
1338  
1339  
1340  
1341  
1342  
1343  
1344  
1345  
1346  
1347  
1348  
1349  
1350  
1351  
1352  
1353  
1354  
1355  
1356  
1357  
1358  
1359  
1360  
1361  
1362  
1363  
1364  
1365  
1366  
1367  
1368  
1369  
1370  
1371  
1372  
1373  
1374  
1375  
1376  
1377  
1378  
1379  
1380  
1381  
1382  
1383  
1384  
1385  
1386  
1387  
1388  
1389  
1390  
1391  
1392  
1393  
1394  
1395  
1396  
1397  
1398  
1399  
1400  
1401  
1402  
1403  
1404  
1405  
1406  
1407  
1408  
1409  
1410  
1411  
1412  
1413  
1414  
1415  
1416  
1417  
1418  
1419  
1420  
1421  
1422  
1423  
1424  
1425  
1426  
1427  
1428  
1429  
1430  
1431  
1432  
1433  
1434  
1435  
1436  
1437  
1438  
1439  
1440  
1441  
1442  
1443  
1444  
1445  
1446  
1447  
1448  
1449  
1450  
1451  
1452  
1453  
1454  
1455  
1456  
1457  
1458  
1459  
1460  
1461  
1462  
1463  
1464  
1465  
1466  
1467  
1468  
1469  
1470  
1471  
1472  
1473  
1474  
1475  
1476  
1477  
1478  
1479  
1480  
1481  
1482  
1483  
1484  
1485  
1486  
1487  
1488  
1489  
1490  
1491  
1492  
1493  
1494  
1495  
1496  
1497  
1498  
1499  
1500  
1501  
1502  
1503  
1504  
1505  
1506  
1507  
1508  
1509  
1510  
1511  
1512  
1513  
1514  
1515  
1516  
1517  
1518  
1519  
1520  
1521  
1522  
1523  
1524  
1525  
1526  
1527  
1528  
1529  
1530  
1531  
1532  
1533  
1534  
1535  
1536  
1537  
1538  
1539  
1540  
1541  
1542  
1543  
1544  
1545  
1546  
1547  
1548  
1549  
1550  
1551  
1552  
1553  
1554  
1555  
1556  
1557  
1558  
1559  
1560  
1561  
1562  
1563  
1564  
1565  
1566  
1567  
1568  
1569  
1570  
1571  
1572  
1573  
1574  
1575  
1576  
1577  
1578  
1579  
1580  
1581  
1582  
1583  
1584  
1585  
1586  
1587  
1588  
1589  
1590  
1591  
1592  
1593  
1594  
1595  
1596  
1597  
1598  
1599  
1600  
1601  
1602  
1603  
1604  
1605  
1606  
1607  
1608  
1609  
1610  
1611  
1612  
1613  
1614  
1615  
1616  
1617  
1618  
1619  
1620  
1621  
1622  
1623  
1624  
1625  
1626  
1627  
1628  
1629  
1630  
1631  
1632  
1633  
1634  
1635  
1636  
1637  
1638  
1639  
1640  
1641  
1642  
1643  
1644  
1645  
1646  
1647  
1648  
1649  
1650  
1651  
1652  
1653  
1654  
1655  
1656  
1657  
1658  
1659  
1660  
1661  
1662  
1663  
1664  
1665  
1666  
1667  
1668  
1669  
1670  
1671  
1672  
1673  
1674  
1675  
1676  
1677  
1678  
1679  
1680  
1681  
1682  
1683  
1684  
1685  
1686  
1687  
1688  
1689  
1690  
1691  
1692  
1693  
1694  
1695  
1696  
1697  
1698  
1699  
1700  
1701  
1702  
1703  
1704  
1705  
1706  
1707  
1708  
1709  
1710  
1711  
1712  
1713  
1714  
1715  
1716  
1717  
1718  
1719  
1720  
1721  
1722  
1723  
1724  
1725  
1726  
1727  
1728  
1729  
1730  
1731  
1732  
1733  
1734  
1735  
1736  
1737  
1738  
1739  
1740  
1741  
1742  
1743  
1744  
1745  
1746  
1747  
1748  
1749  
1750  
1751  
1752  
1753  
1754  
1755  
1756  
1757  
1758  
1759  
1760  
1761  
1762  
1763  
1764  
1765  
1766  
1767  
1768  
1769  
1770  
1771  
1772  
1773  
1774  
1775  
1776  
1777  
1778  
1779  
1780  
1781  
1782  
1783  
1784  
1785  
1786  
1787  
1788  
1789  
1790  
1791  
1792  
1793  
1794  
1795  
1796  
1797  
1798  
1799  
1800  
1801  
1802  
1803  
1804  
1805  
1806  
1807  
1808  
1809  
1810  
1811  
1812  
1813  
1814  
1815  
1816  
1817  
1818  
1819  
1820  
1821  
1822  
1823  
1824  
1825  
1826  
1827  
1828  
1829  
1830  
1831  
1832  
1833  
1834  
1835  
1836  
1837  
1838  
1839  
1840  
1841  
1842  
1843  
1844  
1845  
1846  
1847  
1848  
1849  
1850  
1851  
1852  
1853  
1854  
1855  
1856  
1857  
1858  
1859  
1860  
1861  
1862  
1863  
1864  
1865  
1866  
1867  
1868  
1869  
1870  
1871  
1872  
1873  
1874  
1875  
1876  
1877  
1878  
1879  
1880  
1881  
1882  
1883  
1884  
1885  
1886  
1887  
1888  
1889  
1890  
1891  
1892  
1893  
1894  
1895  
1896  
1897  
1898  
1899  
1900  
1901  
1902  
1903  
1904  
1905  
1906  
1907  
1908  
1909  
1910  
1911  
1912  
1913  
1914  
1915  
1916  
1917  
1918  
1919  
1920  
1921  
1922  
1923  
1924  
1925  
1926  
1927  
1928  
1929  
1930  
1931  
1932  
1933  
1934  
1935  
1936  
1937  
1938  
1939  
1940  
1941  
1942  
1943  
1944  
1945  
1946  
1947  
1948  
1949  
1950  
1951  
1952  
1953  
1954  
1955  
1956  
1957  
1958  
1959  
1960  
1961  
1962  
1963  
1964  
1965  
1966  
1967  
1968  
1969  
1970  
1971  
1972  
1973  
1974  
1975  
1976  
1977  
1978  
1979  
1980  
1981  
1982  
1983  
1984  
1985  
1986  
1987  
1988  
1989  
1990  
1991  
1992  
1993  
1994  
1995  
1996  
1997  
1998  
1999  
2000  
2001  
2002  
2003  
2004  
2005  
2006  
2007  
2008  
2009  
2010  
2011  
2012  
2013  
2014  
2015  
2016  
2017  
2018  
2019  
2020  
2021  
2022  
2023  
2024  
2025  
2026  
2027  
2028  
2029  
2030  
2031  
2032  
2033  
2034  
2035  
2036  
2037  
2038  
2039  
2040  
2041  
2042  
2043  
2044  
2045  
2046  
2047  
2048  
2049  
2050  
2051  
2052  
2053  
2054  
2055  
2056  
2057  
2058  
2059  
2060  
2061  
2062  
2063  
2064  
2065  
2066  
2067  
2068  
2069  
2070  
2071  
2072  
2073  
2074  
2075  
2076  
2077  
2078  
2079  
2080  
2081  
2082  
2083  
2084  
2085  
2086  
2087  
2088  
2089  
2090  
2091  
2092  
2093  
2094  
2095  
2096  
2097  
2098  
2099  
2100  
2101  
2102  
2103  
2104  
2105  
2106  
2107  
2108  
2109  
2110  
2111  
2112  
2113  
2114  
2115  
2116  
2117  
2118  
2119  
2120  
2121  
2122  
2123  
2124  
2125  
2126  
2127  
2128  
2129  
2130  
2131  
2132  
2133  
2134  
2135  
2136  
2137  
2138  
2139  
2140  
2141  
2142  
2143  
2144  
2145  
2146  
2147  
2148  
2149  
2150  
2151  
2152  
2153  
2154  
2155  
2156  
2157  
2158  
2159  
2160  
2161  
2162  
2163  
2164  
2165  
2166  
2167  
2168  
2169  
2170  
2171  
2172  
2173  
2174  
2175  
2176  
2177  
2178  
2179  
2180  
2181  
2182  
2183  
2184  
2185  
2186  
2187  
2188  
2189  
2190  
2191  
2192  
2193  
2194  
2195  
2196  
2197  
2198  
2199  
2200  
2201  
2202  
2203  
2204  
2205  
2206  
2207  
2208  
2209  
2210  
2211  
2212  
2213  
2214  
2215  
2216  
2217  
2218  
2219  
2220  
2221  
2222  
22

ABSTRACT

An interface card for a device with image output capabilities. The interface card includes a connector for connecting to the device and a  
5 controller. The controller sends data for output of an image of a quick-start guide from the interface card to the device through the connector. The controller sends the data once without error and does not send the data to the device again unless  
10 the interface card is reset with respect to whether the data has been sent. In the preferred embodiment, the interface card further includes a non-volatile memory, and the controller stores an indication that the data has been sent without error  
15 in the non-volatile memory in a case that the data has been sent without error. The controller uses the indication to determine if the data has been sent once without error, and the interface card is reset with respect to whether the data has been sent  
20 by resetting the indication. Examples of interface cards according to the invention include, but are not limited to, CD-ROM and DVD cards for computer systems with displays and/or printers, display interface cards, and network interface cards for  
25 printers.



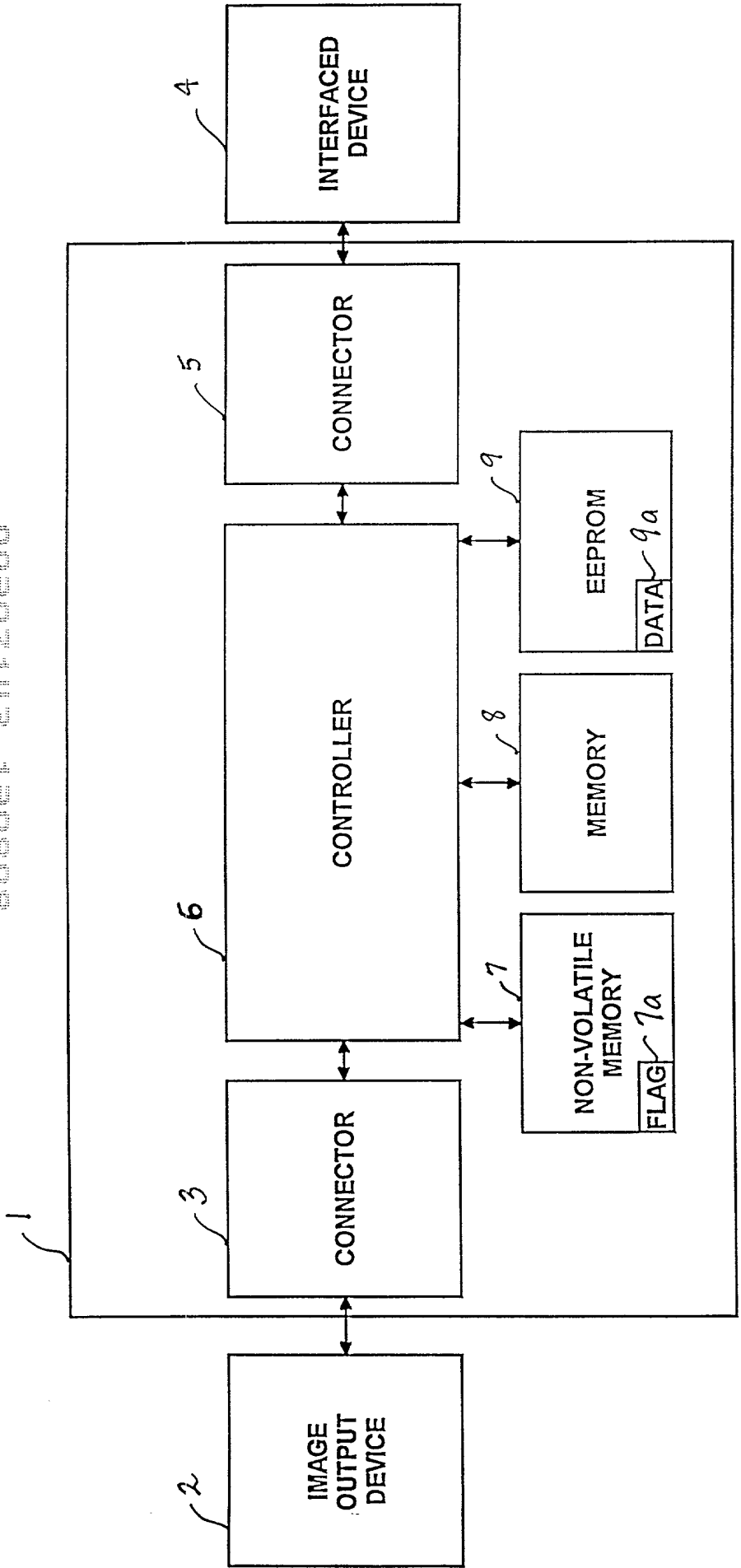


FIG. 1



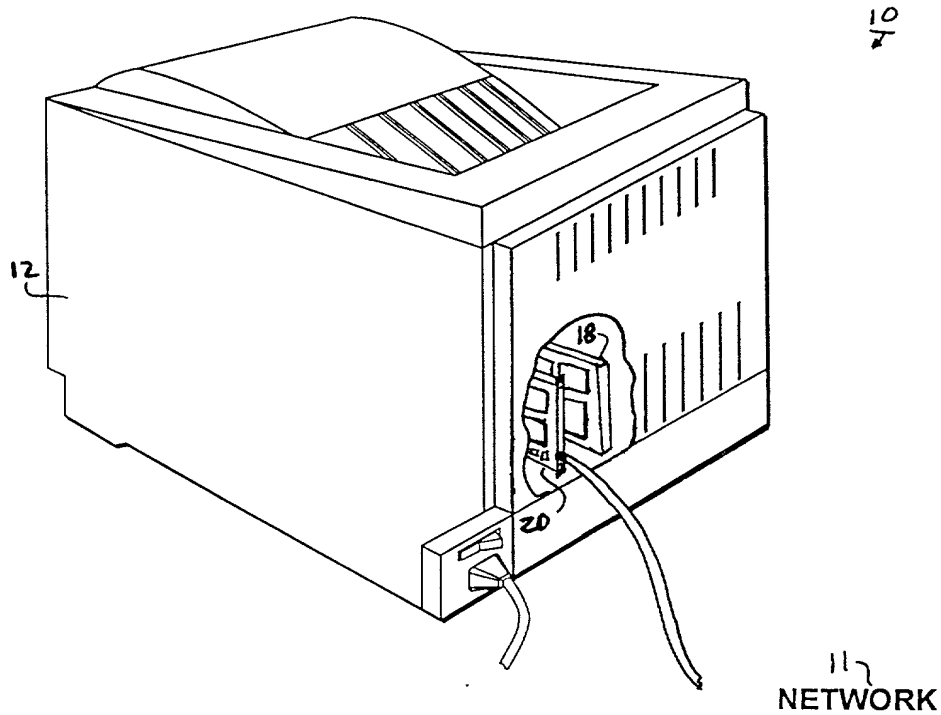


FIG. 3

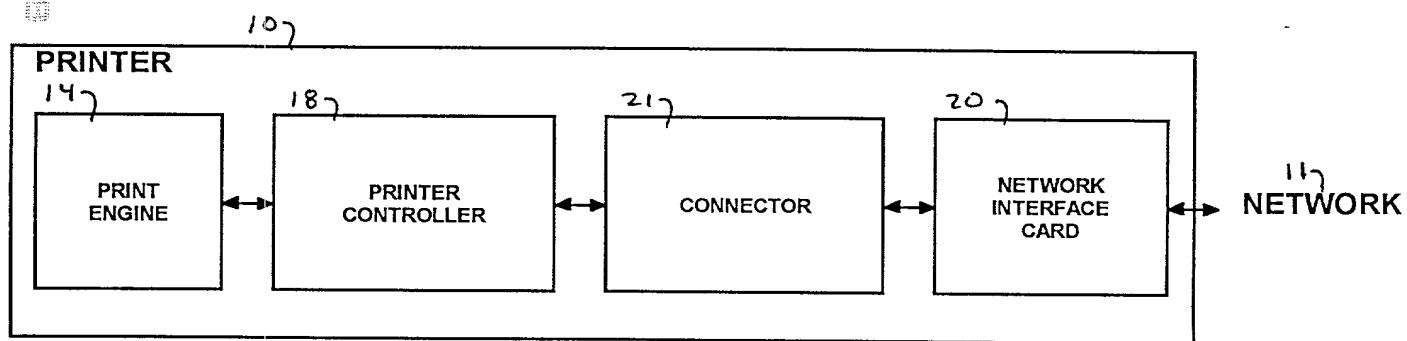


FIG. 4

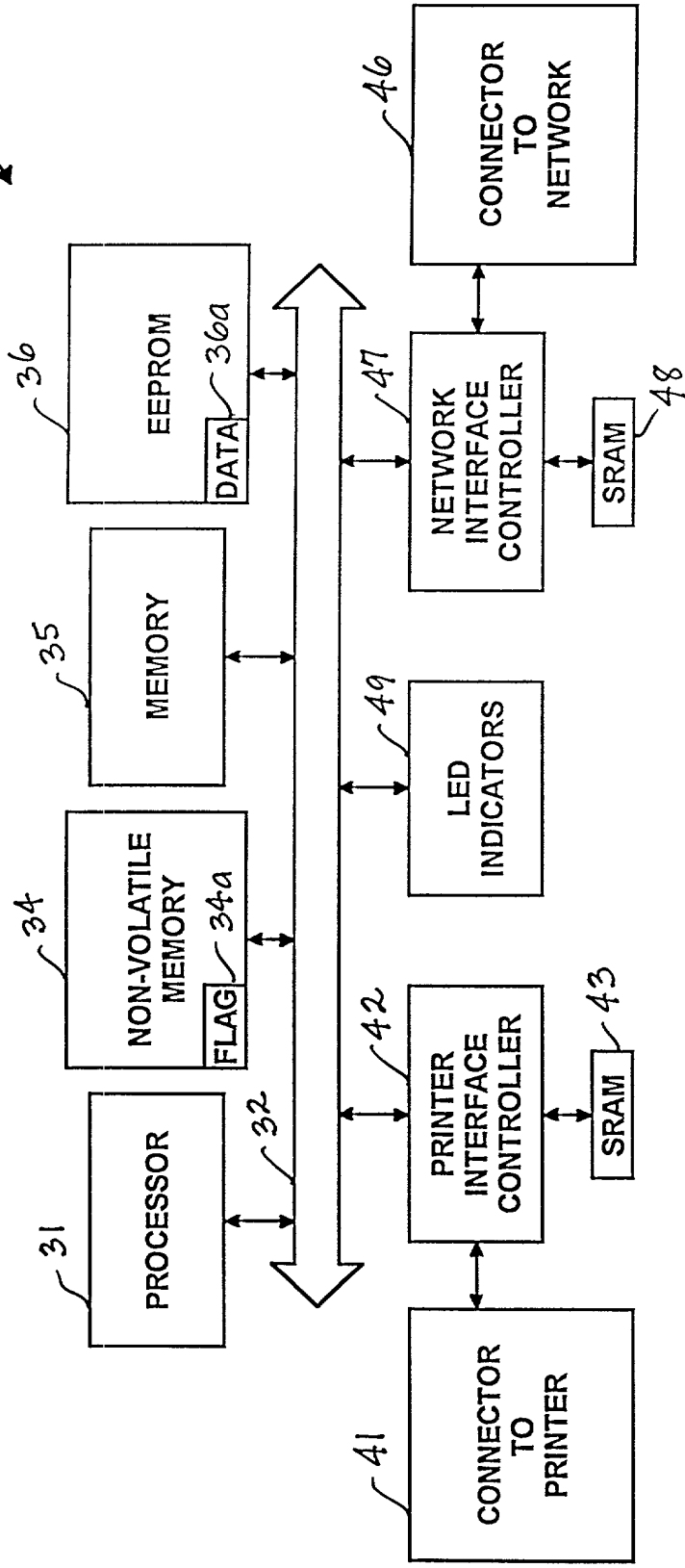


FIG. 5

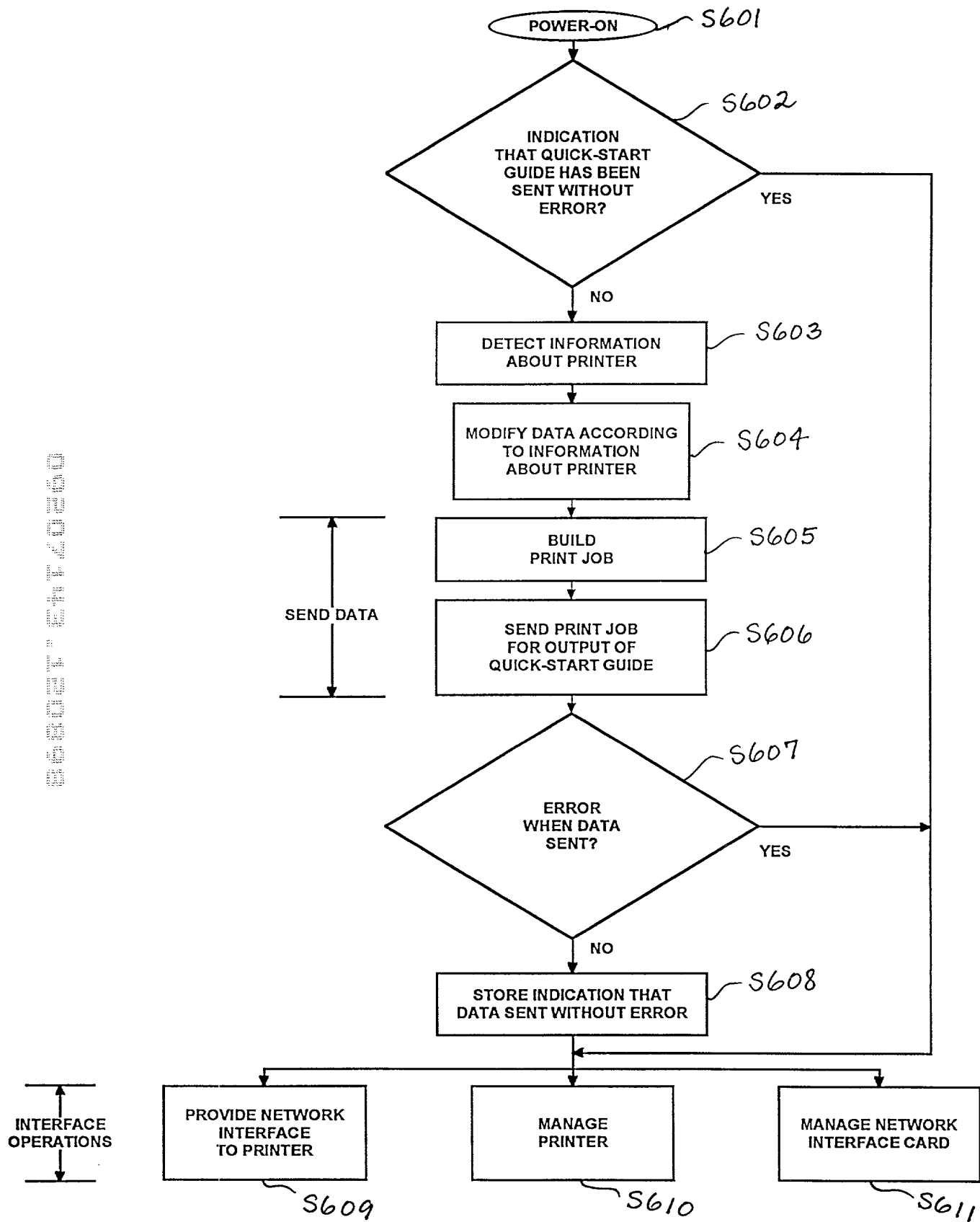


FIG. 6

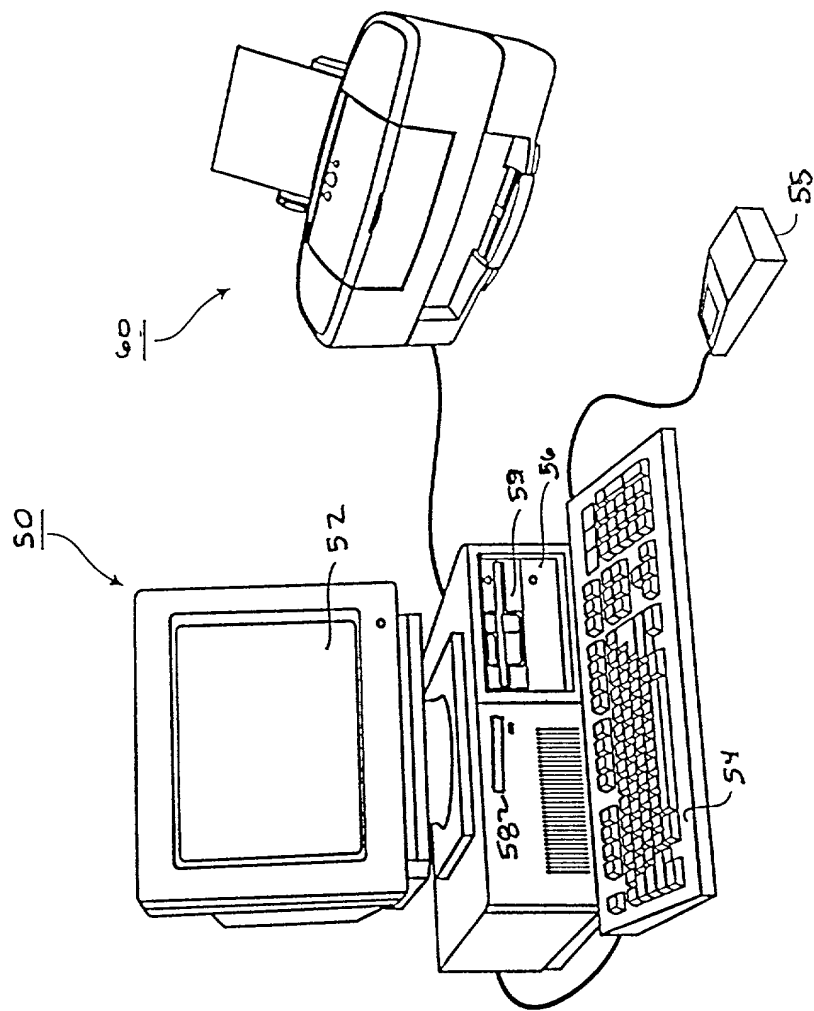


FIG. 7

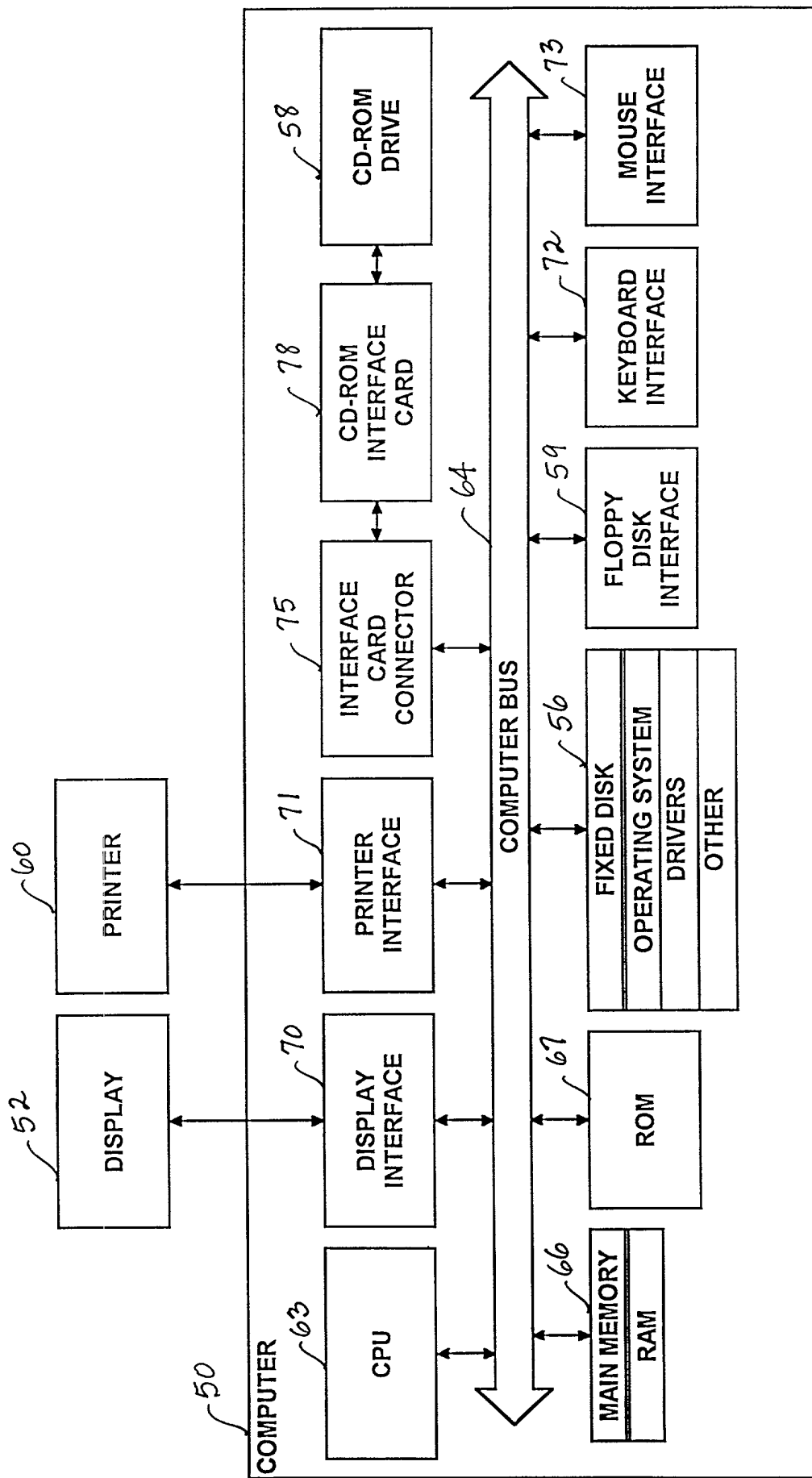


FIG. 8

78

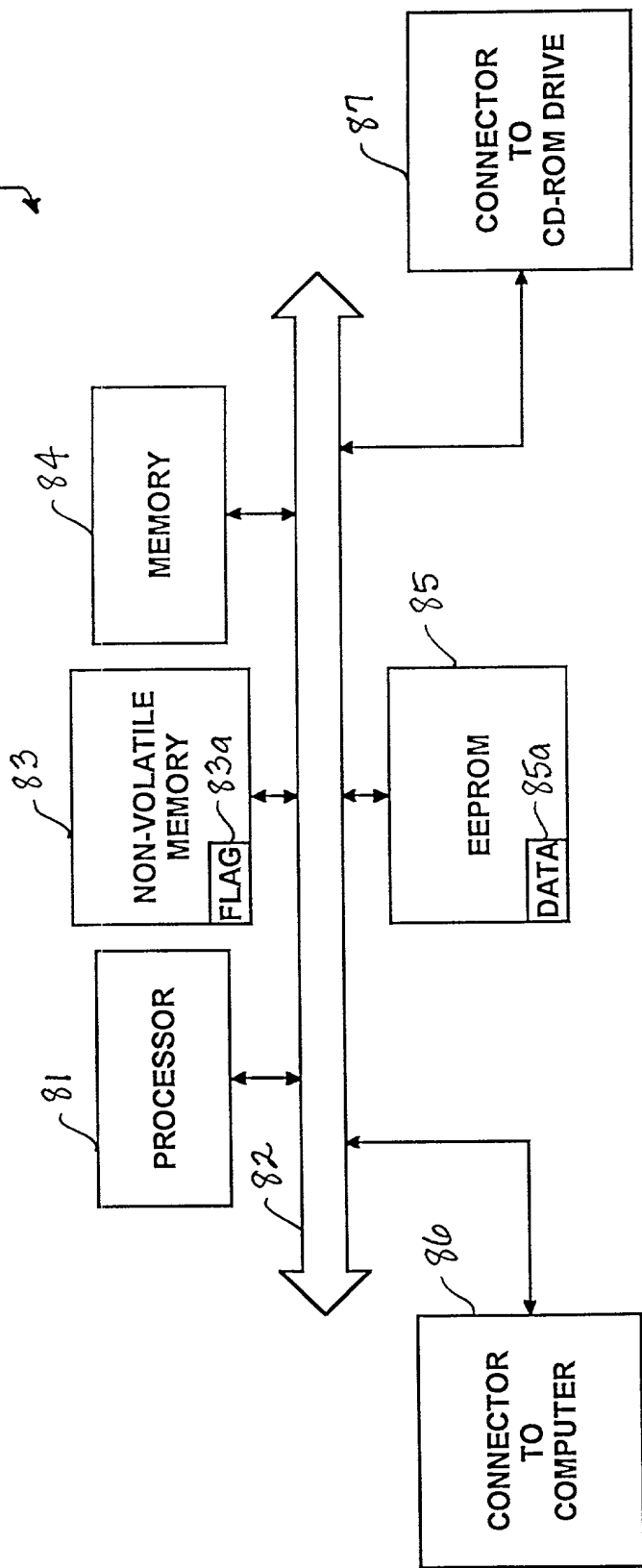


FIG. 9



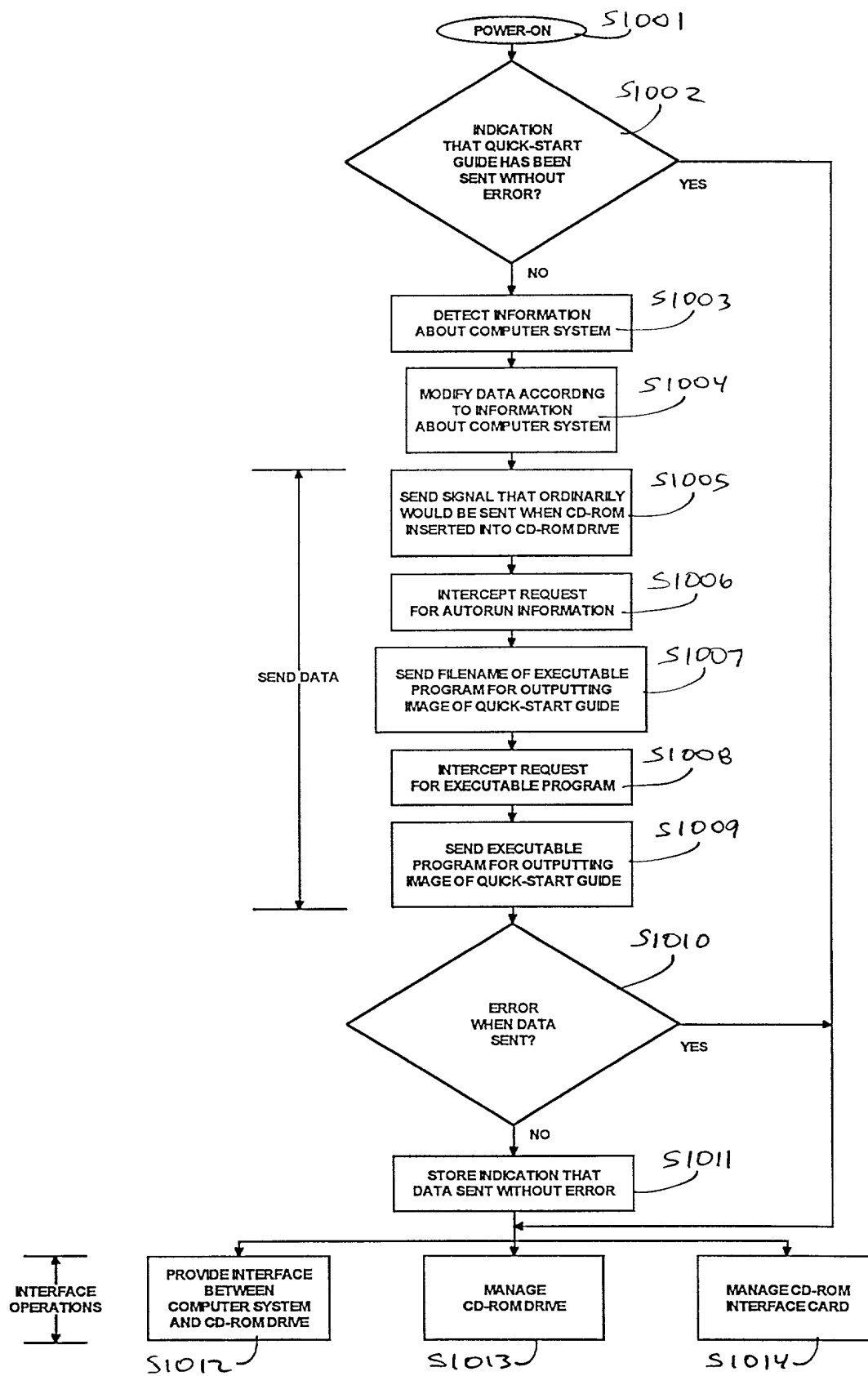


FIG. 10

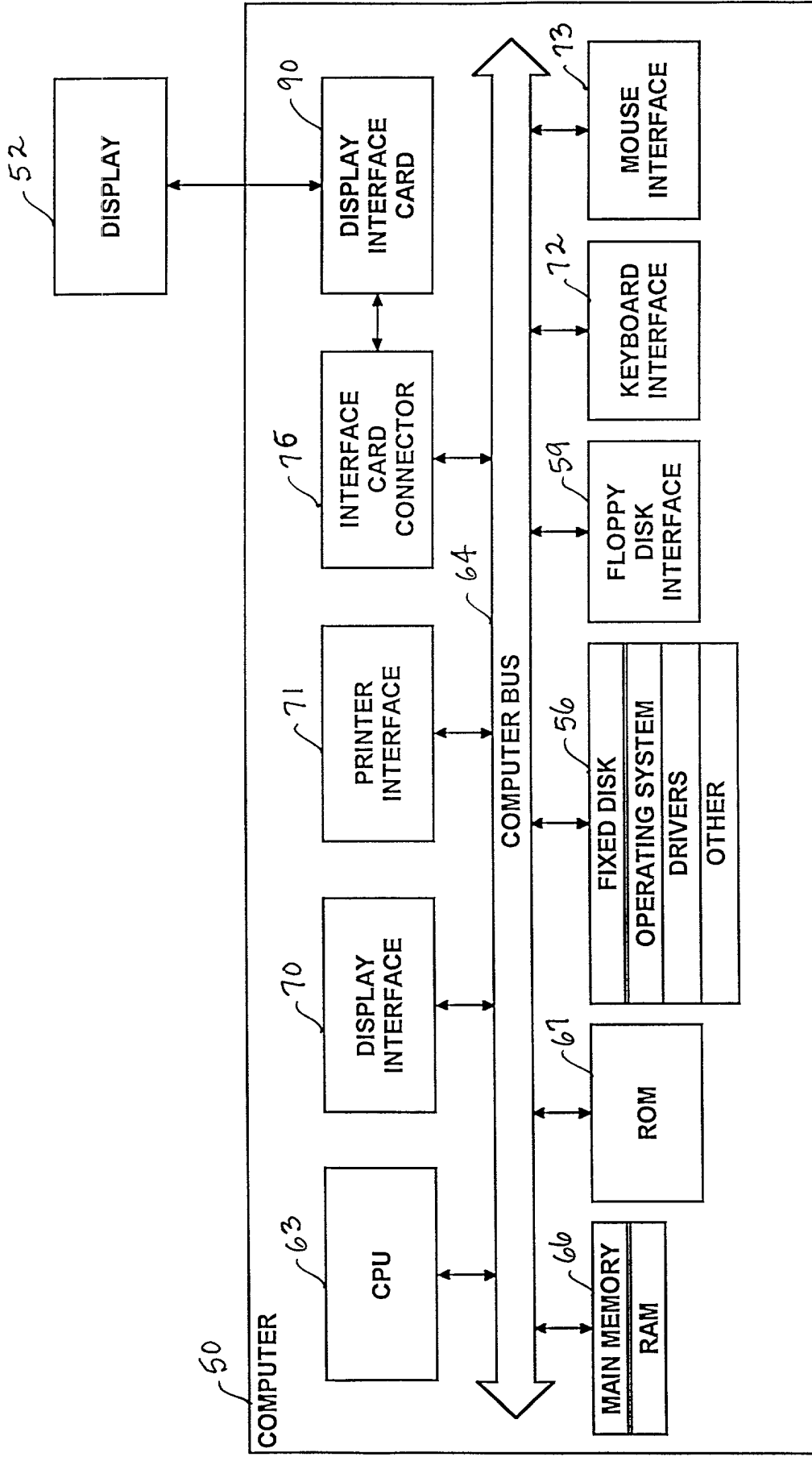


FIG. 11

90

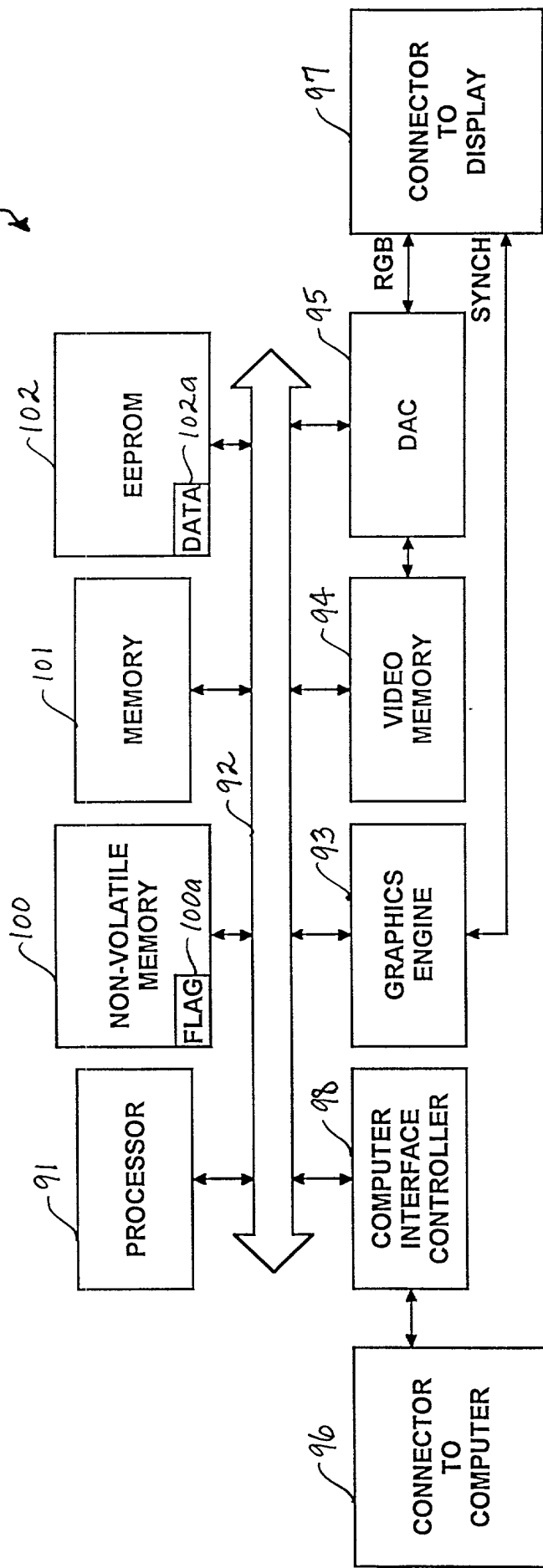


FIG. 12

## INTERFACE OPERATIONS

